Service Manual

PIONEER®
The Art of Entertainment

PION-04893

ORDER NO.
CRT1816

BRIDGEABLE POWER AMPLIFIER

GM-X302ZZ X1H/UC

● **This additional service manual is designed to be used together with Model GM-X302/X1H/UC Service Manual CRT1641. Refer to it for finding parts numbers and adjustment, etc. which are not shown in this manual.** +4271

ELECTRICAL PARTS LIST

● **Amp Unit**

● **Parts List(Page 3)**

Circuit Symbol & No.	GM-X302/X1H/UC Part No.	GM-X302ZZ/X1H/UC Part No.
R121,122,125,126,131,132	RS1/10S153J	RS1/10S822J

EXPLODED VIEW

● **Parts List(Page 17)**

Mark No. Description	GM-X302/X1H/UC Part No.	GM-X302ZZ/X1H/UC Part No.
15 Amp Unit	HWH1190	HWH1224

PACKING METHOD

● **Parts List(Page 21)**

*:Non Spare Parts

Mark No. Description	GM-X302/X1H/UC Part No.	GM-X302ZZ/X1H/UC Part No.
5 Carton	HHG0024	HHG0067
6 Contain Box	HHL0024	HHL0067
* Warranty Card	•••••	HRP0003

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4893

K-ZZB. DEC. 1995 Printed in Japan

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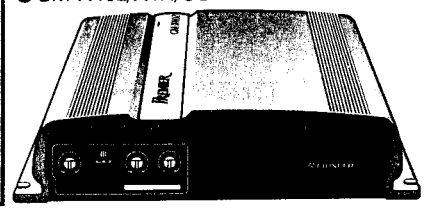
Service Manual

●GM-X402/X1H/UC



ORDER NO.
CRT1641

BRIDGEABLE POWER AMPLIFIER

GM-X402 X1H/UC
GM-X402 X1H/EW,ES
GM-X302 X1H/UC

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SPECIFICATIONS

Power source .....14.4 V DC (10.8 — 15.6 V allowable)
Grounding system .....Negative type
Current consumption .12.5 A (at continuous power, 4Ω)
Average current drawn .....3.5 A (4Ω for two channels)
.....6 A (4Ω for one channel)
Fuse.....15A
Dimensions .....206 (W) × 50 (H) × 175 (D) mm
.....[8-1/8 (W) × 2 (H) × 6-7/8 (D) in.]
Weight...1.9 kg (2.2 lbs.) (Leads for wiring not included)
Maximum power output....70 W × 2/160 W × 1 (EIAJ)
Continuous power output
.....35 W × 2 (at 14.4V, 4Ω, 20 — 20,000 Hz, 0.08% THD)
.....80 W × 1 (at 14.4V, 4Ω, 20 — 20,000 Hz, 0.8% THD)
.....50W × 2 (at 14.4V, 2Ω, 20 — 20,000 Hz, 0.8% THD)
.....25W × 2 (at 12V, 4Ω, 20 — 20,000 Hz, 0.08% THD)
.....55W × 1 (at 12V, 4Ω, 20 — 20,000 Hz, 0.8% THD)
.....35W × 2 (at 12V, 2Ω, 20 — 20,000 Hz, 0.8% THD)
Load impedance.....4Ω (2 — 8Ω allowable)
Frequency response.....10 — 50,000 Hz (+0 dB, – 1 dB)
Signal-to-noise ratio .....105 dB (IHF – A network)
Separation .....60 dB(1 kHz)
Low pass filter .....Cut off frequency: 80Hz
.....Cut off slope: –18 dB/oct
High pass filter .....Cut off frequency: 80 Hz
.....Cut off slope: –12 dB/oct
Bass boost(GM-X402).....Frequency: 40 — 120 Hz
(GM-X302).....Gain:0 — 12 dB(60Hz)
Input level(GM-X402).....RCA: 0.4 — 2 V/22 kΩ
(GM-X402) .....Speaker: 1.6 — 8 V/40 kΩ
Input level/impedance(GM-X302).RCA: 0.4 — 2 V/22 kΩ

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K-FFP. NOV. 1994 Printed in Japan

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1. SAFETY INFORMATION (UC MODEL)

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safely; you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

2. DISASSEMBLY

● Removing the Case and Panel

1.Remove four screws,and then remove two cases.
2.Remove two screws,and then remove panel.

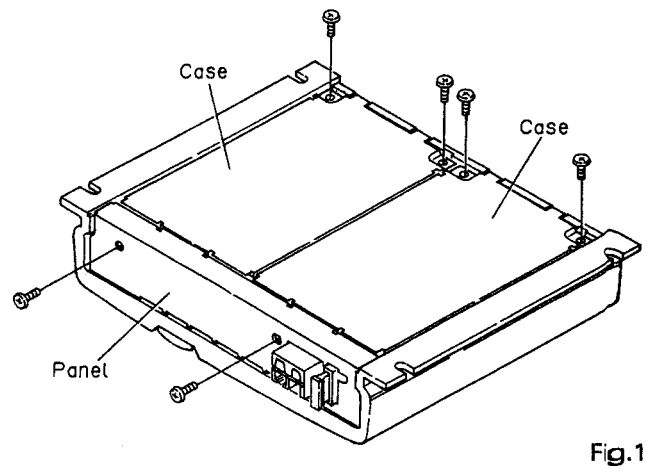


Fig.1

● Removing the Amp Unit

1. Remove eight screws.
2. Amp unit is unremovable from heat sink if pulled up ordinarily,because silicone compound has been applied between heat sink and subheat sink.
   To remove amp unit,therefore,follow steps below.
   a. Unfasten two arbitrary screws securing power transistor.
   b. Screw them little by little alternately into screw holes A to get amp unit afloat and remove it.
3. Once amp unit has been removed,screws with which power transistor has been secured should be returned to thier original position.

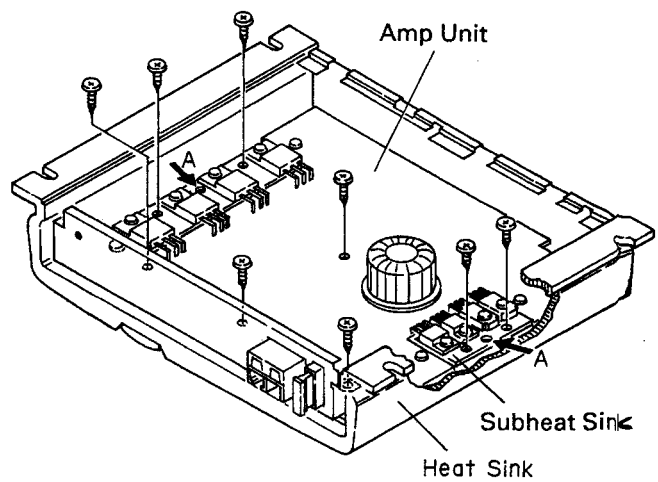


Fig.2

3. ELECTRICAL PARTS LIST

NOTE:

- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*

Chip Resistor

RS1/○S○○○J,RS1/○○S○○○J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

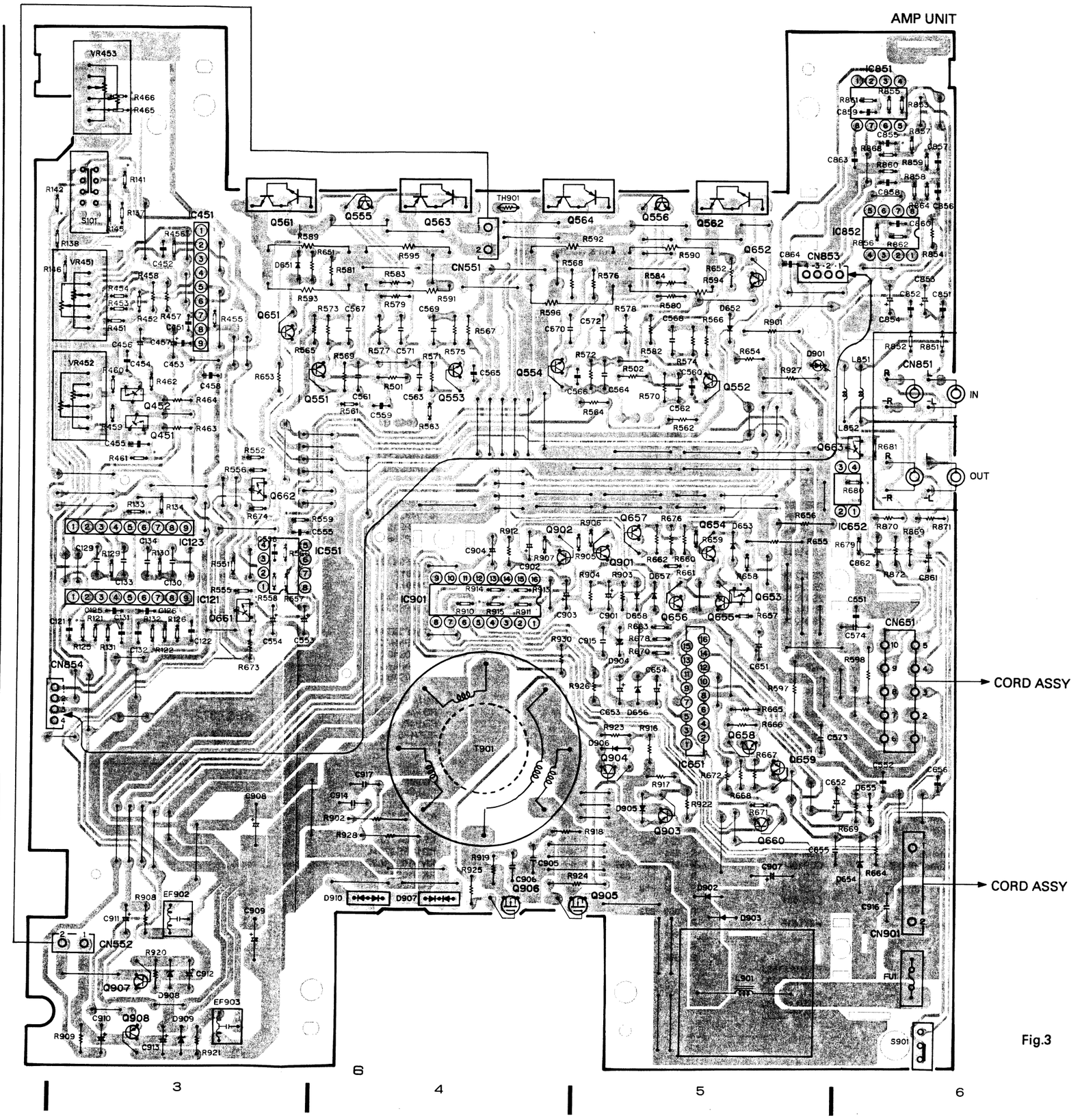
Circuit Symbol & No.	Part Name	Part No.
GM-X402/X1H/UC		
Unit Number	: HWH1188	
Unit Name	: Amp Unit	
MISCELLANEOUS		
IC 121 123 451		UPC4570HA
IC 551 851 852		UPC4570C
IC 651		TA8194Z
IC 652		PC817
IC 901		UPC494C
Q 451 452 661 662		2SC2712
Q 551 552		2SA1145
Q 553 554		2SC2705
Q 555 556		2SD2343
Q 561 562		2SD2438
Q 563 564		2SB1587
Q 651 652		2SD1768S
Q 653 663		2SA1162
Q 654 655 656 658		2SC2458
Q 657 659 902 903		2SA1048
Q 660 908		2SB1243
Q 901		2SC2458
Q 904		2SA1048
Q 905 906	FET	IRFIZ44G
Q 907		2SD1864
D 651 652 653 655		1SS133
D 654		HZ30P
D 656		HZS7LA2
D 657 658 905 906		1SS133
D 901	LED	BR4361F
D 902 903		ERA15-02VH
D 904		HZS18L3
D 907		ESAC25M-02C
D 908 909		HZS16L1
D 910		ESAC25M-02N
L 851 852	Ferri-Inductor	CTF1007
L 901	Choke Coil 50 μH	CTH1142
T 901	Transformer	CTT1034
TH 901	Thermistor	CCX1013
S 101	Switch(LPF/HPF Select)	CSH1029
S 901	Switch(BFC)	HSH-156
VR 451	Volume 10kΩ(C)	CCS1240
VR 452	Volume 50kΩ(C)	CCS1242
VR 453	Volume 10kΩ(A)	CCS1241
EF 902 903		CCG-081
FU1	Fuse 15A	HEK0015
RESISTORS		
R 121 122 125 126		RS1/10S153J
R 129 130		RS1/10S123J
R 131 132 561 563		RS1/10S153J
R 133 134 853		RS1/10S223J
R 137 138 141 142		RS1/10S222J
R 145 146 551 552		RS1/10S222J
R 451		RS1/10S473J
R 452		RS1/8S473J
R 453 454		RS1/10S432J
R 455 456		RS1/10S182J
R 457 458 662 930		RD1/4PS221JL
R 459 460		RS1/10S822J
R 461 462 671		RS1/10S221J
R 463 464 579 580		RD1/4PS222JL
R 465		RS1/8S391J
R 466		RS1/10S391J
R 501 502		RD1/4PS471JL
R 555 556		RS1/10S822J
R 557 558		RS1/10S471J
R 559 560		RS1/10S223J
R 562 564		RD1/4PS153JL
R 565 566 567 568		RD1/4PS561JL
R 569 570 571 572		RD1/4PS473JL
R 573 574 575 576		RD1/4PS161JL
R 577 578		RD1/4PS562JL
R 581 582 583 584		RD1/4PS473JL
R 589 590 591 592	0.22Ω	CCN1013
R 593 594 595 596	0.22Ω	CCN1013
R 597 598		RS1/2P100JL
R 651 652		RD1/4PS393JL
R 653 654		RD1/4PS564JL
R 655 656		RD1/4PM473J
R 657 670		RS1/10S104J
R 658 661 674 905		RS1/10S472J
R 659 663 680 681		RS1/10S103J
R 660 667 676		RD1/4PS222JL
R 664		RD1/4PS182JL
R 665		RD1/4PS103JL
R 666 903 904		RD1/4PS102JL
R 668 920 921		RD1/4PS472JL
R 669 922 923		RD1/4PS101JL
R 672		RD1/4PS152JL
R 673		RD1/4PS472JL
R 678		RS1/10S103J
R 679		RS1/10S222J
R 851 852		RS1/8S471J
R 854		RD1/4PS223JL
R 855 856 857 858		RN1/10SE103D
R 859 860 861 862		RN1/10SE103D
R 864 868		RS1/10S331J
R 869 872		RD1/4PS183JL
R 870 871		RD1/4PS104JL
R 901 927		RS1/2P561JL
R 902		RS1/2P220JL
R 906		RS1/10S103J
R 907		RS1/10S183J
R 908 909		RD1/4PS100JL
R 910		RS1/10S153J
R 911		RS1/10S102J
R 912		RD1/4PS272JL
R 913 914 915		RS1/10S472J
R 916 917		RD1/4PS332JL
R 918 919		RD1/4PS220JL
R 924		RS1/2P560JL
R 925		RD1/4PS560JL
R 926		RD1/4PS105JL
R 928		RS1/2P220JL
CAPACITORS		
C 121 122		CKSYB474K16
C 125 126		CKSQYB273K25
C 129 130 133 134		CFTNA124J50
C 131 132		CKSYB184K16
C 451 452		CCSQCH330J50
C 453 454		CEAS4R7M35
C 455 456		CKSYB224K25
C 457 458		CKSQYB473K25
C 551 552		CKSYB104K25
C 553 554		CEAS101M10
C 555 556		CCSQCH680J50
C 559 560 565 566		CCSQCH220J50
C 561 562 563 564		CCPSL330J50L
C 567 568 569 570		CFTNA224J50
C 571 572		CFTNA223J50
C 573 574		CFTNA333J50
C 651	220 μF/10V	CCH1036
C 652		CEAS331M16
C 653		CEAS470M16
C 654		CEAS220M16
C 655		CFTNA103J50
C 656		CKSQYB103K50
C 851 852		CKSQYB471K50
C 853 854 861 862		CEAS100M16
C 855 856		CKSQYB472K50
C 857 858 859 860		CCSQCH470J50
C 863 864		CKSQYB103K50
C 901 904		CEAS010M50
C 902		CEAS221M10
C 903		CEAS2R2M50
C 905 906		CQMA472J50
C 907	3300 μF/16V	CCH1130
C 908 909	3300 μF/35V	CCH1200
C 910 911		CEAS101M35
C 912 913		CEAS0R1M50
C 914 915		CQMA102J50
C 916		CFTNA224J50
C 917		CQMA102J50

- The GM-X302/X1H/UC,GM-X402/X1H/EW and GM-X402/X1H/ES Parts Lists enumerate the parts which differ from those for the GM-X402/X1H/UC only. The parts other than those enumerated in the GM-X302/X1H/UC,GM-X402/X1H/EW and GM-X402/X1H/ES Parts Lists are identical with those in the GM-X402/X1H/UC Parts List,to which you are requested to refer,accordingly. The GM-X402/X1H/UC Parts List is given on page 3.

Amp Unit

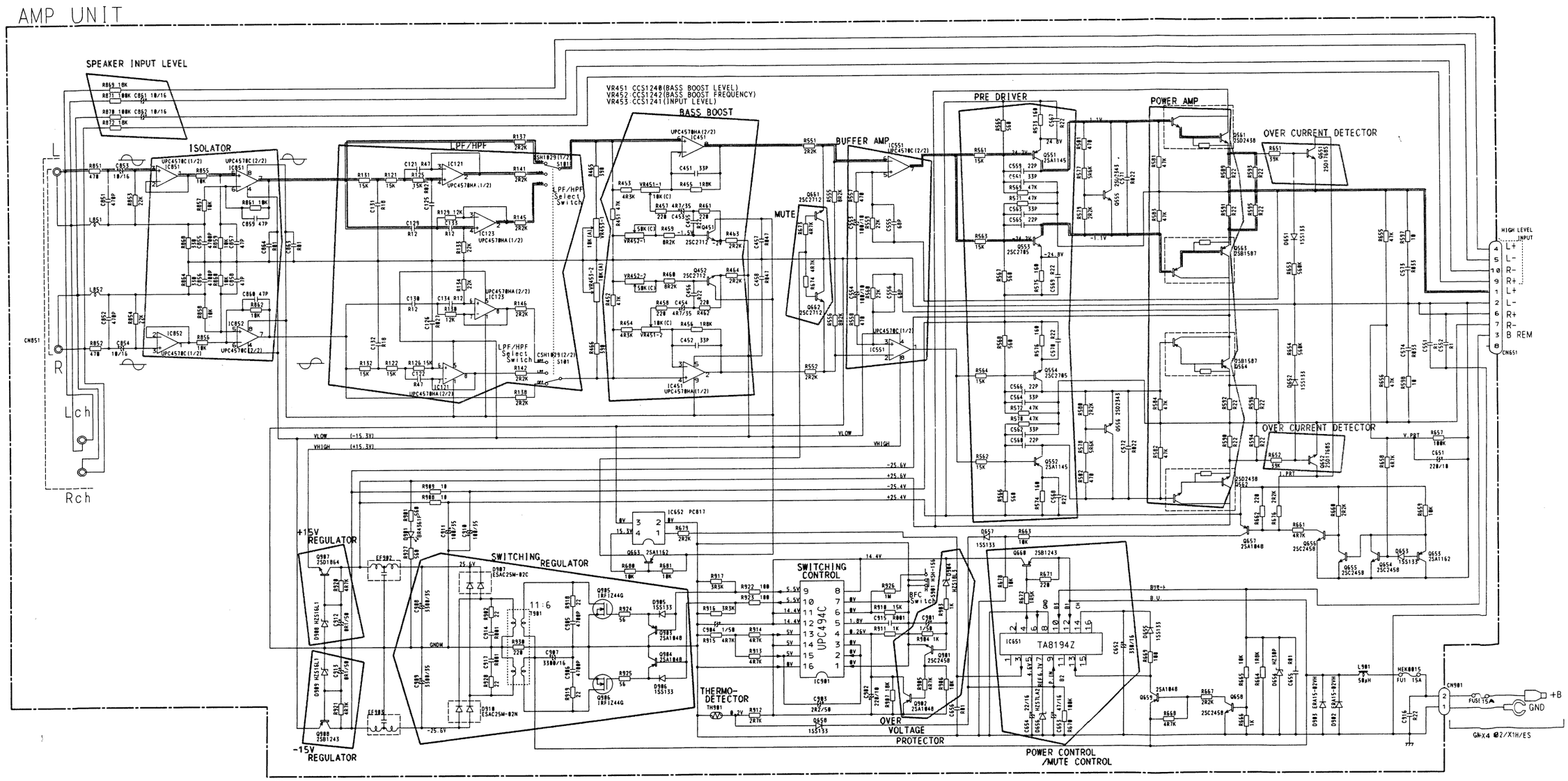
Circuit Symbol & No.	GM-X402/X1H/UC Part No.	GM-X302/X1H/UC Part No.	GM-X402/X1H/EW Part No.	GM-X402/X1H/ES Part No.
VR452	CCS1242	·····	CCS1242	CCS1242
R469,470	·····	RS1/10S223J	·····	·····
R869,872	RD1/4PS183JL	·····	·····	RD1/4PS183JL
R870,871	RD1/4PS104JL	·····	·····	RD1/4PS104JL
C861,862	CEAS100M16	·····	·····	CEAS100M16

4. CONNECTION DIAGRAM (GM-X402/X1H/UC,ES)



5 1 2 3 6 4 5 6

5. SCHEMATIC CIRCUIT DIAGRAM(GM-X402/X1H/UC,ES)



SWITCHES:
AMP UNIT
S101:LPF/HPF SELECT SWITCH···LPF-OFF-HPF
S901:BFC SWITCH·····LOW-HIGH
The underlined indicates the switch position.

NOTE:
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

CN651

10	9	8	7	6
5	4	3	2	1

Fig.4

6. CONNECTION DIAGRAM (GM-X402/X1H/EW)

IC, Q

IC851

Q564 Q556 Q562

Q561 Q555 Q563

IC852 IC451

Q652

Q651

Q551 Q553 Q554

Q552 Q452

Q451

Q663

Q662 IC652

IC123 Q657

IC551 Q902 Q901 Q654

Q656 Q655 Q653

IC121 IC901

Q661

IC651

Q658

Q904 Q659

Q903 Q660

Q906 Q905

Q907

Q908

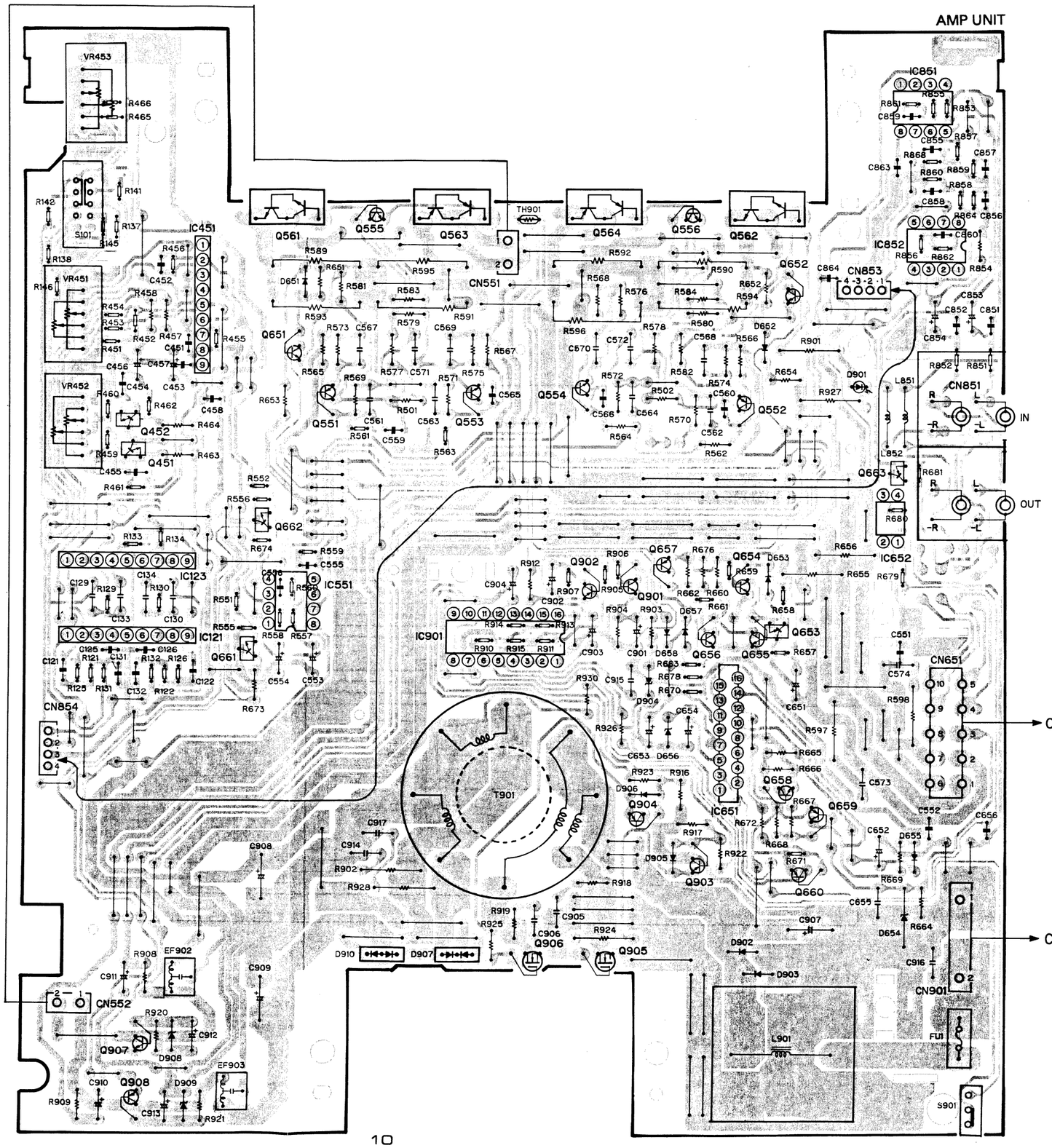
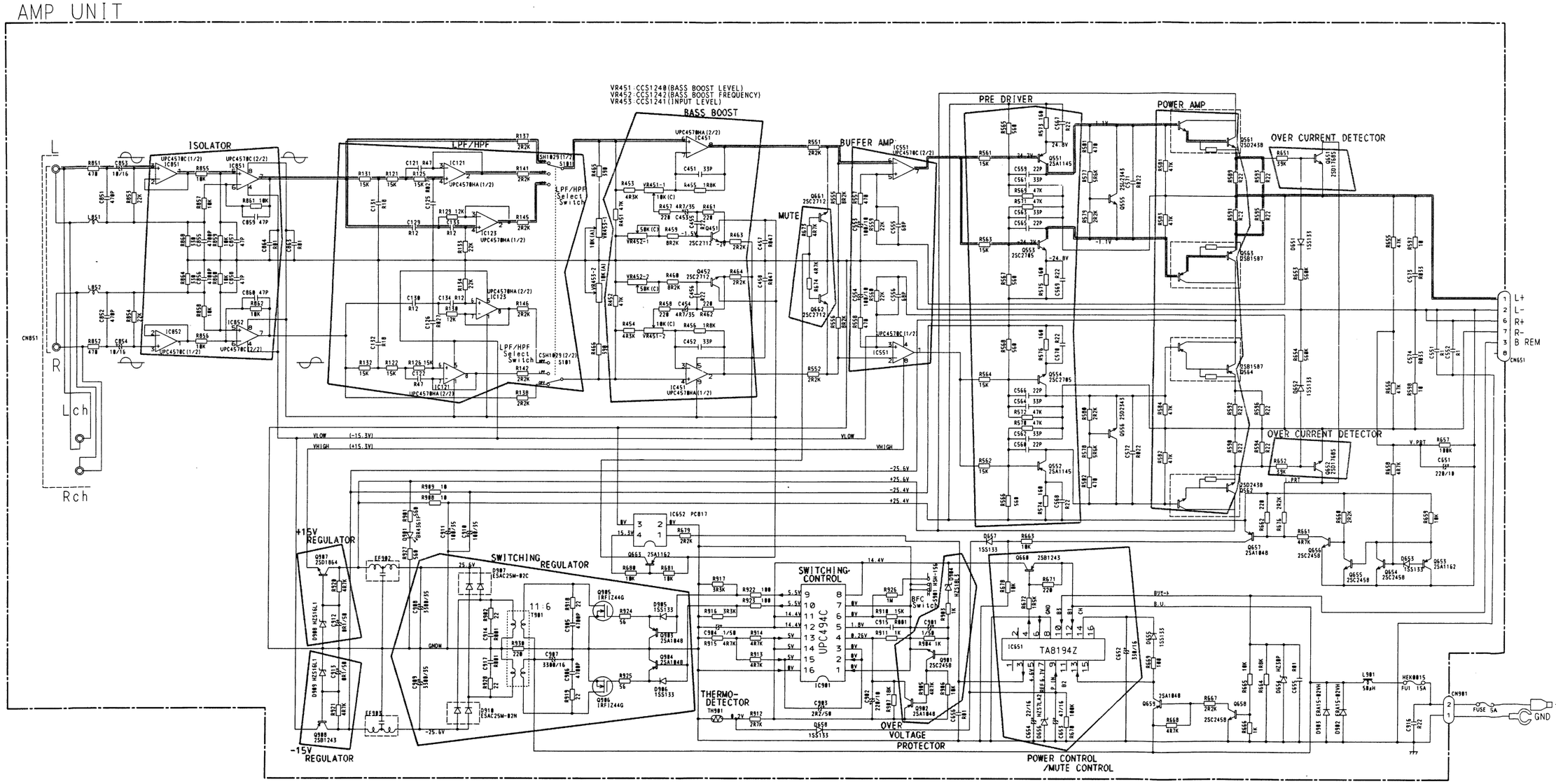


Fig.5

A B C D

9 1 2 3 10 4 5 6

7. SCHEMATIC CIRCUIT DIAGRAM(GM-X402/X1H/EW)



SWITCHES:
AMP UNIT
S101:LPF/HPF SELECT SWITCH···LPF-OFF-HPF
S901:BFC SWITCH·····LOW-HIGH
The underlined indicates the switch position.

NOTE:
- ⊏⊐ Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- ⊣⊢ Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

CN651

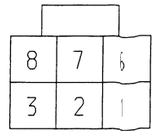


Fig.6

8. CONNECTION DIAGRAM (GM-X302/X1H/UC)

IC, Q

IC851

Q564 Q556 Q562
Q561 Q555 Q563

IC852
IC451

Q652

Q651

Q551 Q553 Q554

Q552
Q452

Q451

Q663

Q662 IC652

IC123 Q657

IC551 Q902 Q901 Q654
Q656 Q655 Q653

IC121 IC901
Q661

IC651

Q658

Q904 Q659

Q903 Q660

Q906 Q905

Q907

Q908

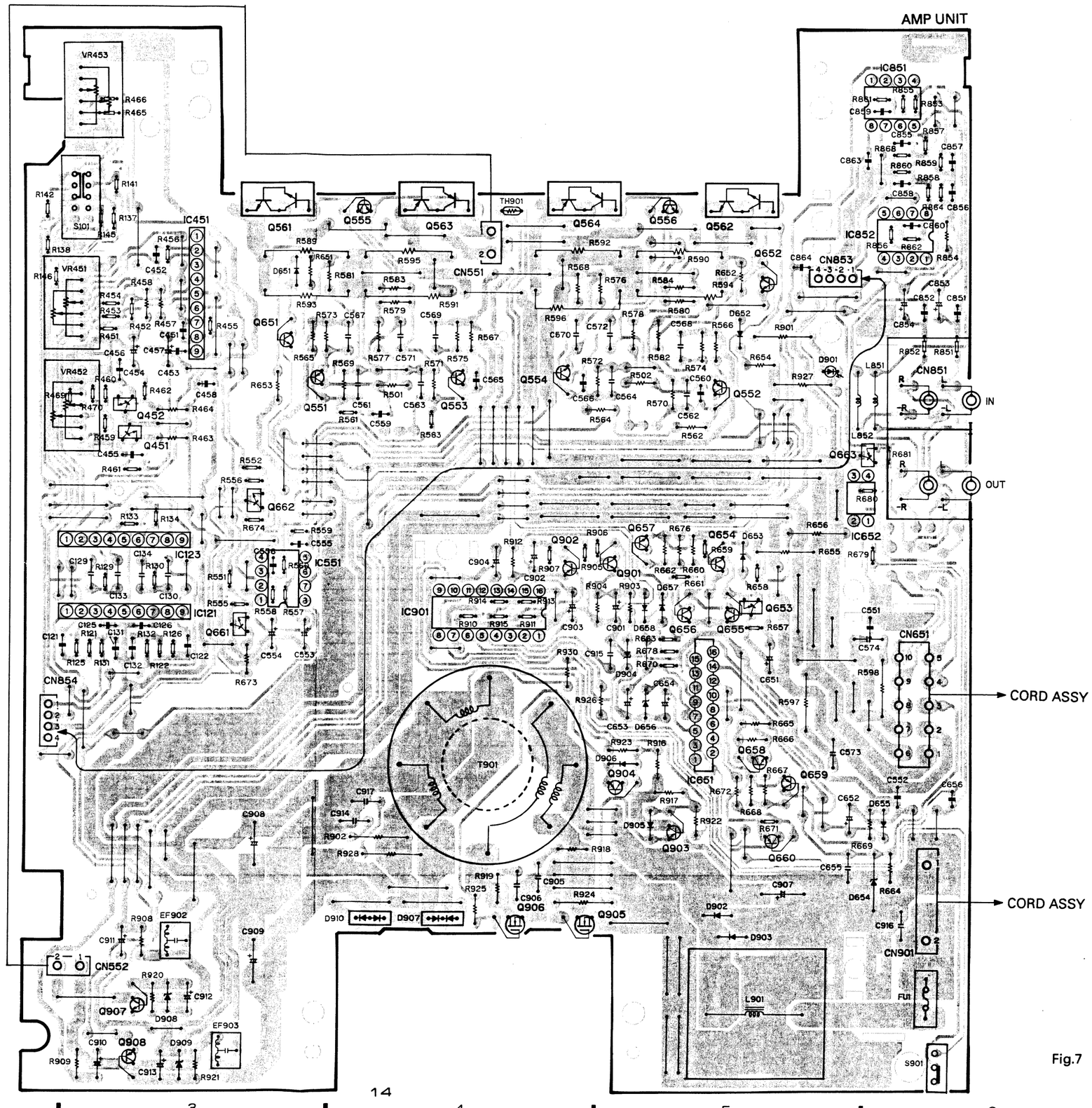
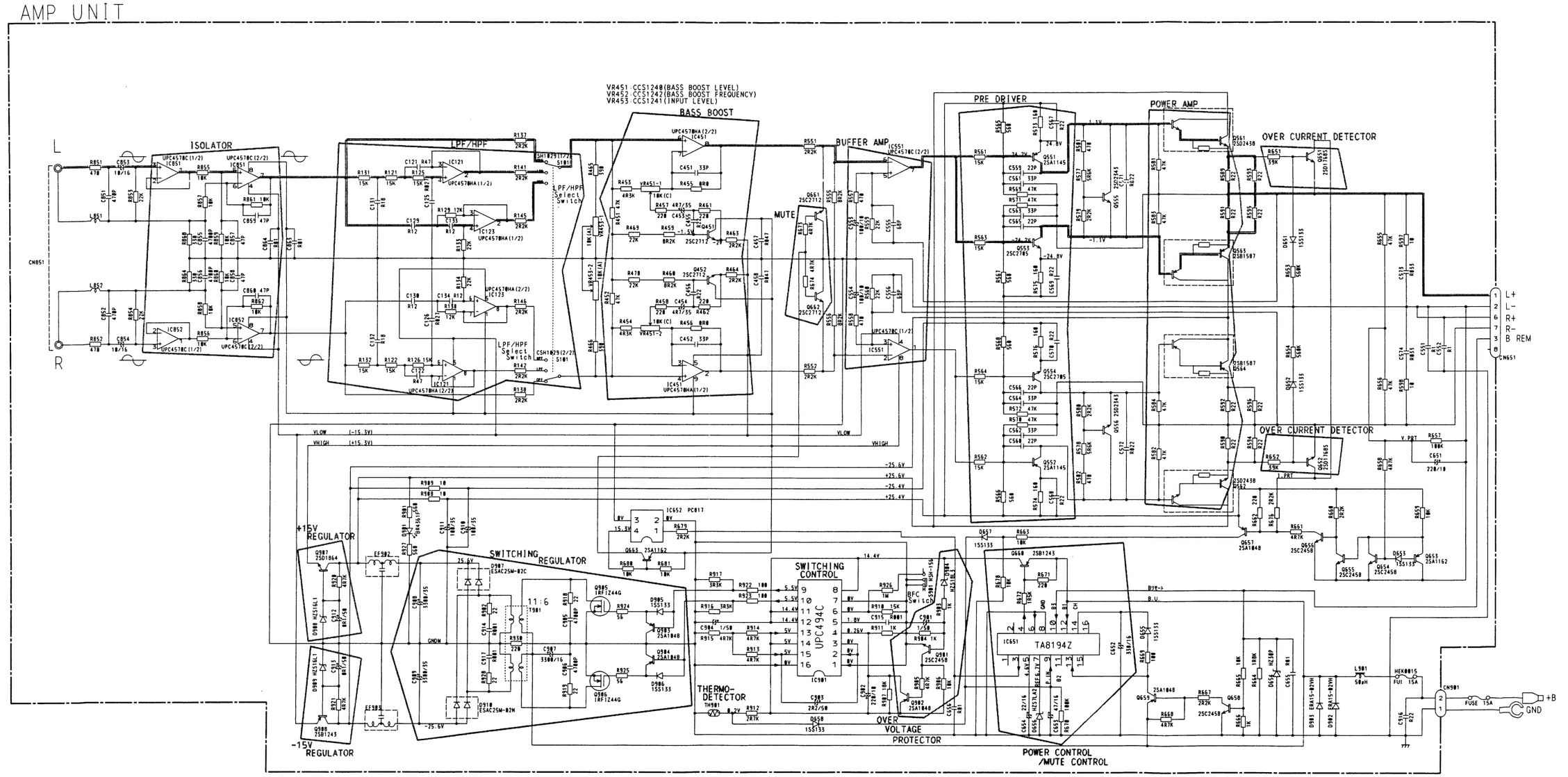


Fig.7

9. SCHEMATIC CIRCUIT DIAGRAM(GM-X302/X1H/UC)



SWITCHES:
AMP UNIT
S101:LPF/HPF SELECT SWITCH···LPF-OFF-HPF
S901:BFC SWITCH·····LOW-HIGH
The underlined indicates the switch position.

NOTE
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

CN651

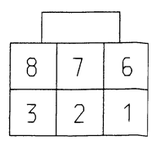


Fig.8

10. EXPLODED VIEW

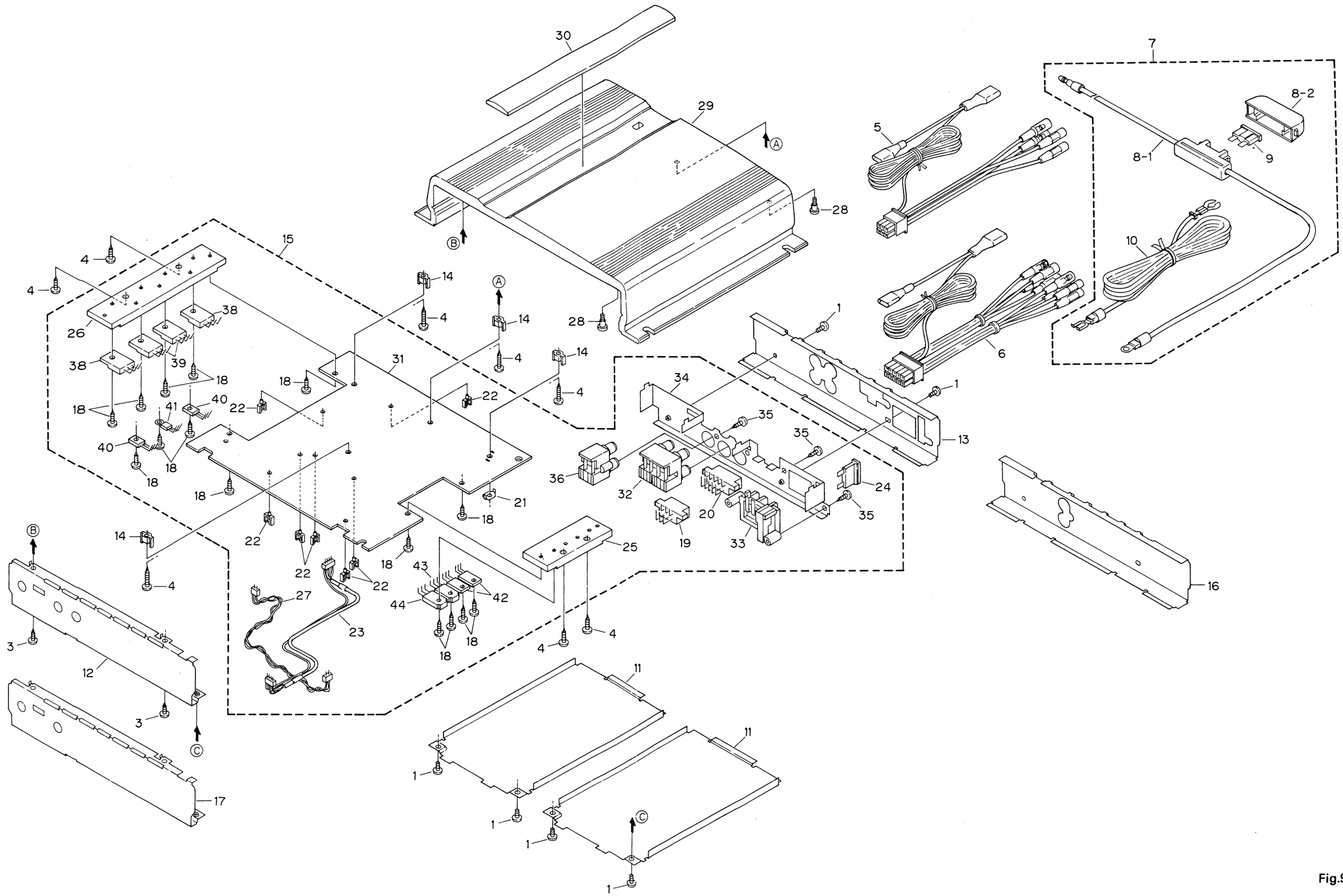


Fig.9

NOTE:

- Parts marked by "✱"are generally unavailable because they are not in our Master Spare Parts List.
- Parts marked by "◉"are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

● Parts List(GM-X402/X1H/UC)

Mark	No.	Description	Part No.
	1	Screw	BSZ30P050FZK
	2	•••••	
	3	Screw(M3×6)	CBA1320
	4	Screw(M3×12)	CBA1323
	5	•••••	
	6	Cord Assy	HDE4414
	7-10	•••••	
	11	Case	HNB1840
	12	Panel	HNB1841
	13	Panel	HNB1842
	14	Spacer	HNV3975
	15	Amp Unit	HWH1188
	16	•••••	
	17	•••••	
	18	Screw(M3×10)	CBA1322
	19	•••••	
	20	Plug(CN651)	CKM1100
	21	Holder	CNC2218
	22	Clamper	CNV1335
	23	Connector	HDE4418
	24	Fuse(FU1)	HEK0015
	25	Heat Sink (Subheat Sink)	HNR1354
	26	Heat Sink (Subheat Sink)	HNR1355
	27	Cord	CDE4610
	28	Screw(M3×5)	CBA1330
	29	Heat Sink	HNR1340
	30	Plate Unit	HXA7364
	31	P.C.Board	CNP3788
	32	Pin Jack(CN851)	CKB1020
	33	Terminal(CN901)	CKE1036
	34	Holder	HNC5511
	35	Screw	PPZ30P060FZK
	36	•••••	
	37	•••••	
	38	Transistor(Q561,562)	2SD2438
	39	Transistor(Q563,564)	2SB1587
	40	Transistor(Q555,556)	2SD2343
	41	Thermister(TH901)	CCX1013
	42	Transistor(Q905,906)	IRFIZ44G
	43	Diode(D907)	ESAC25M-02C
	44	Diode(D910)	ESAC25M-02N

• The GM-X302/X1H/UC,GM-X402/X1H/EW and GM-X402/X1H/ES Parts Lists enumerate the parts which differ from those for the GM-X402/X1H/UC only. The parts other than those enumerated in the GM-X302/X1H/UC,GM-X402/X1H/EW and GM-X402/X1H/ES Parts Lists are identical with those in the GM-X402/X1H/UC Parts List,to which you are requested to refer,accordingly. The GM-X402/X1H/UC Parts List is given on page 19.

Mark	No.	Description	GM-X402/X1H/UC Part No.	GM-X302/X1H/UC Part No.	GM-X402/X1H/EW Part No.	GM-X402/X1H/ES Part No.
	5	Cord Assy	•••••	HDE4416	HDE4416	•••••
	6	Cord Assy	HDE4414	•••••	•••••	HDE4414
	7	Cord Assy	•••••	HDE4453	HDE4453	HDE4453
*	8	Cord	•••••	HDE4425	HDE4425	HDE4425
	9	Fuse	•••••	HEK0015	HEK0015	HEK0015
	10	Cord	•••••	HDE4517	HDE4517	HDE4517
	12	Panel	HNB1841	•••••	HNB1857	HNB1841
	13	Panel	HNB1842	•••••	HNB1864	HNB1842
	15	Amp Unit	HWH1188	HWH1190	HWH1192	HWH1189
	16	Panel	•••••	HNB1844	•••••	•••••
	17	Panel	•••••	HNB1856	•••••	•••••
	19	Plug(CN651)	•••••	CKM1099	CKM1099	•••••
	20	Plug(CN651)	CKM1100	•••••	•••••	CKM1100
	29	Heat Sink	HNR1340	HNR1344	HNR1344	HNR1344
	30	Plate Unit	HXA7364	HXA7368	HXA7366	HXA7366
	32	Pin Jack(CN851)	CKB1020	•••••	CKB1019	CKB1019
	33	Terminal(CN901)	CKE1036	CKE1035	CKE1035	CKE1035
	34	Holder	HNC5511	HNC5516	HNC5516	HNC5511
	36	Pin Jack(CN851)	•••••	CKB1011	•••••	•••••

11. PACKING METHOD

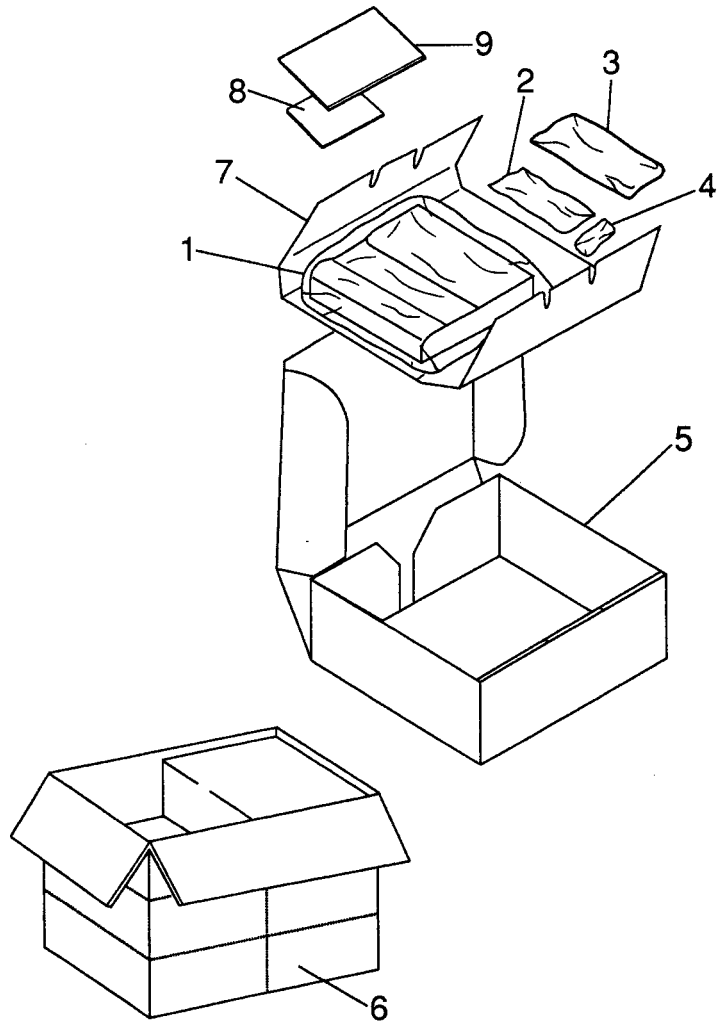


Fig.10

● **Parts List(GM-X402/X1H/UC)**

Mark No.	Description	GM-X402/X1H/UC Part No.	GM-X302/X1H/UC Part No.	GM-X402/X1H/EW Part No.	GM-X402/X1H/ES Part No.
1	Polyethylene Bag	HEG0010	HEG0010	HEG0010	HEG0010
2	Cord Assy(Output)	HDE4414	HDE4416	HDE4416	HDE4414
3	Cord Assy(Power Supply)	•••••	HDE4453	HDE4453	HDE4453
4	Screw Assy	HEA0003	HEA0003	HEA0003	HEA0003
* 4-1	Screw(×4)	BNC40P180FZK	BNC40P180FZK	BNC40P180FZK	BNC40P180FZK
4-2	Polyethylene Bag	HEG0011	HEG0011	HEG0011	HEG0011
5	Carton	HHG0026	HHG0024	HHG0028	HHG0030
6	Contain Box	HHL0026	HHL0024	HHL0028	HHL0030
7	Protector	HHP0002	HHP0002	HHP0002	HHP0002
* 8	Warranty Card	HRY1070	•••••	HRY1071	•••••
9	Owner's Manual	HRD0007	HRD0006	HRD0009	HRD0011

Owner's Manual

Part No.	Model	Language
HRD0006	GM-X302/X1H/UC	English,French
HRD0007	GM-X402/X1H/UC	English,French
HRD0009	GM-X402/X1H/EW	English,French,German,Dutch,Spanish,Swedish,Norwegian,Finnish,Italian
HRD0011	GM-X402/X1H/ES	English,French,Spanish,Arabic

12. OPERATIONS AND CONNECTION(GM-X402/X1H/UC)

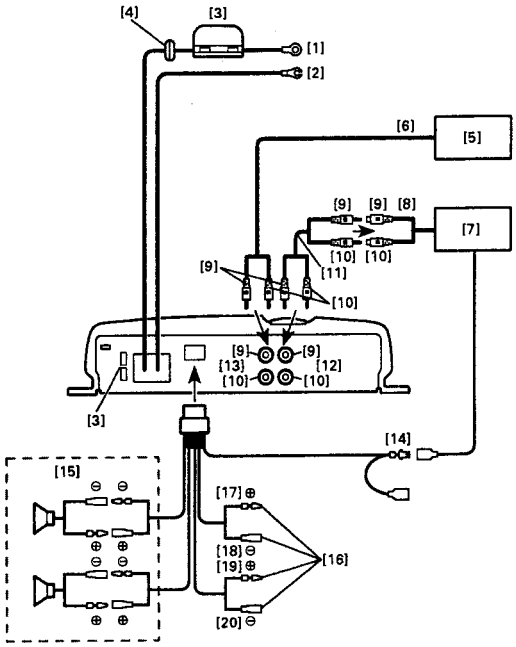


Fig. 11

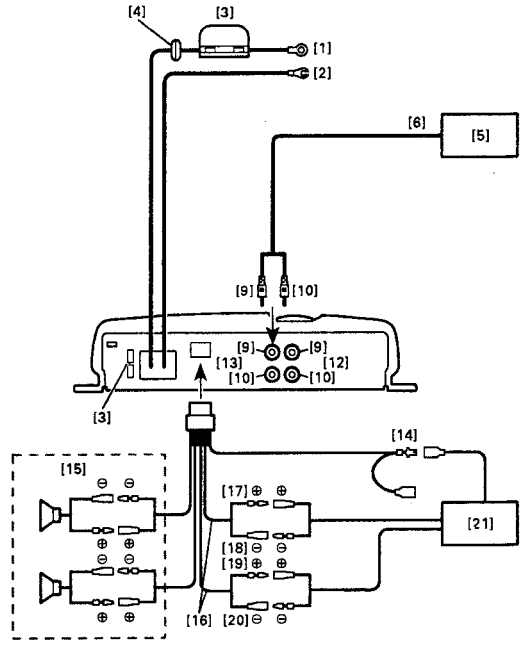


Fig. 12

Setting of This Unit

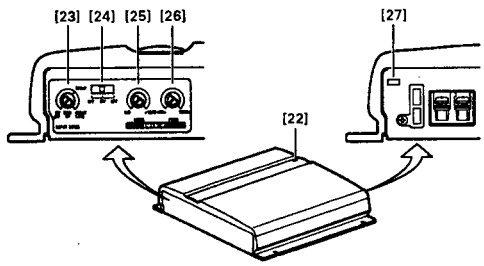


Fig. 13

(Fig. 13)

[22] Power Indicator
The power indicator lights when the power is switched on.

[23] Input Level Adjustment
If the sound is too low, even when the volume of the car stereo used along with this power amplifier is turned up, turn input level control on the back of the power amplifier clockwise. If the sound distorts when the volume is turned up, turn the input level control counterclockwise.
- Set the input level control to 500 mV when this amplifier is connected to a Pioneer car stereo with RCA output jacks. If the sound is too low or distorts, adjust the input level control.
- If you hear much noise when using the speaker input terminals, turn the input level control clockwise.

[24] LPF (Low-Pass Filter)/HPF (High-Pass Filter) Select Switch
Set the LPF/HPF select switch as follows according to the type of the speaker that is connected to the speaker output connector and the car stereo system:

LPF/HPF Select Switch	Audio frequency range to be output	Speaker Type	Remarks
LPF (left)	Very-low-frequency range	Sub-woofer	Connect a sub-woofer.
OFF (center)	Very-low-frequency range to high-frequency range	Other than sub-woofer	
HPF (right)	Low-frequency range to high-frequency range	Other than sub-woofer	If you want to cut the very-low-frequency range because it is not necessary for the speaker you use.

[25] Bass Boost Level Control
Bass boost level control can boost the level around the frequency selected by the bass boost frequency control to 0 to 12 dB.

[26] Bass Boost Frequency Control
You can select a bass boost frequency from 40 to 120 Hz with the bass boost control.
- [25] [26] can be adjusted only when the LPF/HPF select switch is set to a position other than HPF.

[27] BFC (Beat Frequency Control) Switch
If you hear a beat while listening to an AM broadcast with your car stereo, change the BFC switch using a small screwdriver.

Connecting The Unit

⚠ CAUTION

- *Remove the negative (–) terminal of the battery to avoid the risk of short-circuit and damage to the unit.*
- *Secure the wiring with cable clamps or adhesive tape. To protect the wiring, wrap adhesive tape around them where they lie against metal parts.*
- *Do not route wires where they will get hot, for example where the heater will blow over them. If the insulation heats up, it may become damaged, resulting in a short-circuit through the vehicle body.*
- *Make sure that wires will not interfere with moving parts of the vehicle, such as the gearshift, handbrake or seat sliding mechanism.*
- *Do not shorten any leads. Otherwise the protection circuit may fail to work when it should.*
- *Never feed power to other equipment by cutting the insulation of the power supply wire to tap from the wire. The current capacity of the wire will be exceeded, causing overheating.*
- *Always use the special red battery power and ground wire [RD-222], which is sold separately. Connect the special red battery power wire directly to the car battery and the black ground wire to the car body. (The special red battery power and ground wire [RD-222] are designed so that the amplifier can be connected safely.)*

⊘ To prevent damage

- *Do not ground the speaker wire directly or connect a negative (–) wire for several speakers.*
- *Speakers to be connected to the amplifier should conform with the standards listed below. Otherwise damage will be caused to the speaker. The speaker impedance must be 2 to 8 ohms.*

Speaker		Power
Channel	Type	
Two-channel	Sub-woofer	Nominal input: Min. 35 W
	Other than sub-woofer	Max. input: Min. 70 W
One-channel	Sub-woofer	Nominal input: Min. 80 W
	Other than sub-woofer	Max. input: Min. 160 W

⊘ If many units are connected

- *If you let the car engine idle for a long time with the car stereo on, the battery may go flat. Turn the car stereo off when the engine is idling.*
- *If the blue lead of the amplifier is connected to the power terminal through the ignition switch (12 VDC), the amplifier will always be on when the ignition is on—regardless of whether the car stereo is on or off. Because of this, the battery could go flat if you let the engine idle.*
- This unit is for vehicles with a 12-volt battery and negative grounding. Before installing it in a recreational vehicle, truck, or bus, check the battery voltage.
- Install and route the sold separately special red battery wire [RD-222] as faraway as possible from the speaker wires. Install and route the sold separately special red battery wire, ground wire [RD-222], speaker wires, and the amplifier as faraway as possible from the antenna, antenna cable and tuner.

If RCA input pin jacks are connected

(Fig. 11)

If the speaker input terminals are connected (Fig. 12)

[1] Special red battery wire [RD-222] (sold separately)
After making all other connections at the amplifier, connect the battery wire terminal of the amplifier to the positive (+) terminal of the battery.
[2] Ground wire (black) (sold separately)
Connect to metal body or chassis.
[3] Fuse (Special red battery power wire: 30 A, Amplifier: 15 A)
[4] Grommet
[5] Amplifier with RCA input pin jacks
[6] RCA input
[7] Car stereo with RCA output pin jacks
[8] External output
[9] White
[10] Red
[11] Connecting leads with RCA pin plugs. (sold separately)
[12] RCA input pin jack
[13] RCA output pin jack
[14] Blue
Connect the male terminal of this lead to the blue lead of the car stereo (system control terminal). The female terminal can be connected to the auto-antenna relay control terminal.
If the car stereo does not have a system remote control terminal, connect the male terminal to the power terminal through the ignition switch.
[15] Speaker output terminals
See the "Connecting the Speakers" section for speaker connection instructions.
[16] Speaker input terminals
If RCA input pin jacks are used, do not connect the speaker input terminals.
[17] Green
[18] Green/black
[19] Gray
[20] Gray/black
[21] Car stereo with speaker out pin jacks

Connecting the Power Terminal

- *Always use the special red battery power and ground wire [RD-222], which is sold separately. Connect the special red battery power cord directly to the car battery and the black ground wire to the car body. (The special red battery power and ground wire [RD-222] are designed so that the amplifier can be connected safely.)*

Pass the special red battery wire from the engine compartment to the interior of the vehicle.

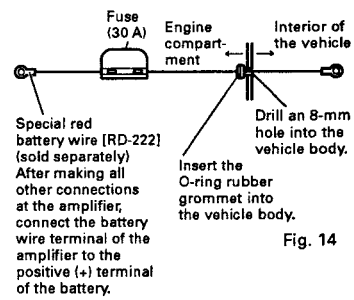

Fuse (30 A)
Engine compart-ment
Interior of the vehicle
Special red battery wire [RD-222] (sold separately) After making all other connections at the amplifier, connect the battery wire terminal of the amplifier to the positive (+) terminal of the battery.
Drill an 8-mm hole into the vehicle body.
Insert the O-ring rubber grommet into the vehicle body.

Fig. 14

Connect the special red battery wire to the POWER terminal (+), and the black ground wire to the GND terminal (–).

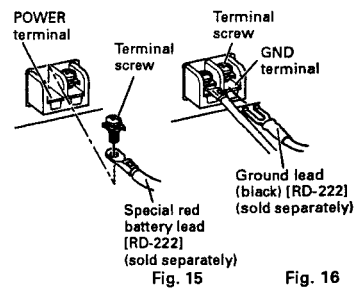


Fig. 15 Fig. 16

- Securely fasten the special red battery wire and the ground wires with terminal screws.

Connecting the Speakers

The speaker output mode can be two-channel (stereo), one-channel (mono), or three-channel (stereo + mono). To connect the speaker leads to suit the mode. Connect the speakers according to the figure below.

Two-channel mode (stereo)

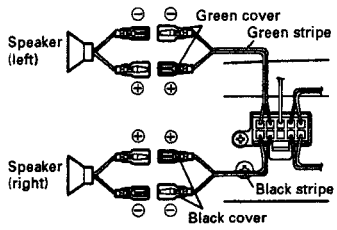


Fig. 17

One-channel mode (mono)

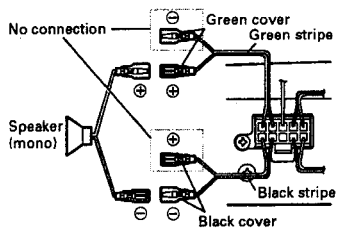


Fig. 18

Three-channel mode (stereo + mono)

The power amplifier is basically a two-channel/one-channel bridgeable amplifier, but three channels can be achieved by combining the stereo and mono modes using inductors and capacitors. See Figs. 19 and 20 for details of wiring.

- *The following Figs. 19 and 20 require advanced understanding of electronics. If you do not understand the diagram, please have the work done by your nearest authorized Pioneer installation specialist.*

Three-channel mode, two-way system

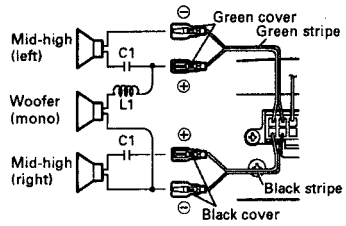


Fig. 19

Three-channel mode, three-way system

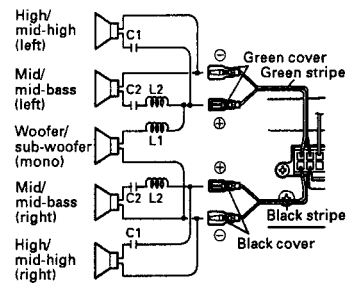


Fig. 20

- The inductor (L1 or L2 in the diagram) acts as a low-pass filter. The capacitor (C1 or C2 in the diagram) acts as a high-pass filter. The inductor (L) shall be used on the woofer/sub-woofer, and that a capacitor (C) shall be used on the high/mid-high.
- *Remember when bridging an amplifier it will see only half of the original speaker impedance. Therefore, you must use speakers that have ratings of 4 ohms or higher. If you use speakers that have lower impedance ratings it may cause damage to the amplifier.*
- *When the inductors and capacitors are connected to the speaker wires, secure or solder them so they cannot be pulled loose. Tape or use heat shrink on the joints to prevent short circuits.*

13. OPERATIONS AND CONNECTION(GM-X302/X1H/UC)

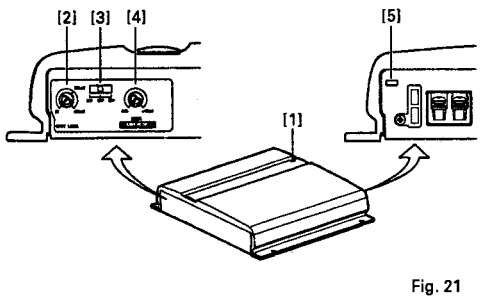


Fig. 21

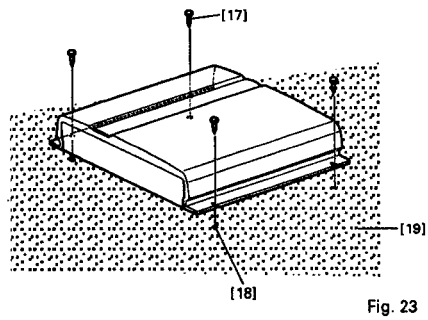


Fig. 23

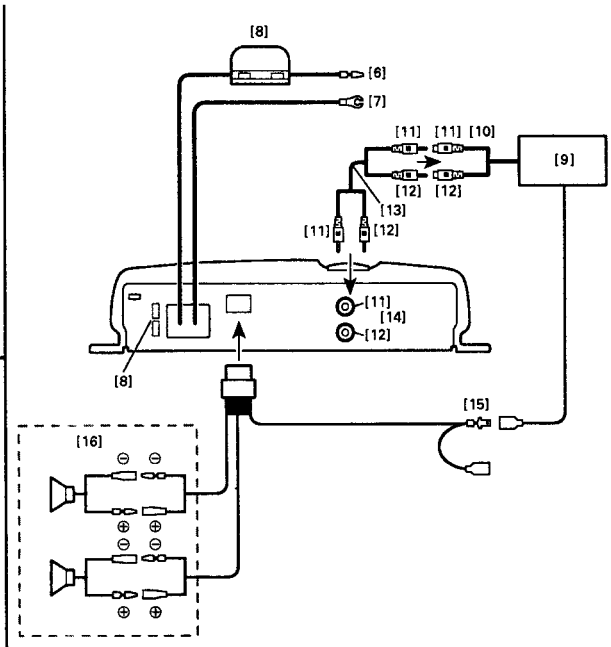


Fig. 22

Setting of This Unit

(Fig. 21)

[1] Power Indicator
The power indicator lights when the power is switched on.

[2] Input Level Adjustment
If the sound is too low, even when the volume of the car stereo used along with this power amplifier is turned up, turn input level control on the back of the power amplifier clockwise. If the sound distorts when the volume is turned up, turn the input level control counterclockwise.
- Set the input level control to 500 mV when this amplifier is connected to a Pioneer car stereo with RCA output jacks. If the sound is too low or distorts, adjust the input level control.

[3] LPF (Low-Pass Filter)/HPF (High-Pass Filter) Select Switch (GM-X302)
Set the LPF/HPF select switch as follows according to the type of the speaker that is connected to the speaker output connector and the car stereo system:

LPF/HPF Select Switch	Audio frequency range to be output	Speaker Type	Remarks
LPF (left)	Very-low-frequency range	Subwoofer	Connect a sub-woofer.
OFF (center)	Very-low-frequency range to high-frequency range	Other than subwoofer	
HPF (right)	Low-frequency range to high-frequency range	Other than subwoofer	If you want to cut the very-low-frequency range because it is not necessary for the speaker you use.

[4] Bass Boost Level Control (GM-X302)
Bass boost level control can boost the level around 60 Hz to 0 to 12 dB.
- Bass boost level control can be adjusted only when the LPF/HPF select switch is set to a position other than HPF .

[5] BFC (Beat Frequency Control) Switch
If you hear a beat while listening to an AM broadcast with your car stereo, change the BFC switch using a small screwdriver.

Connecting The Unit

⚠ CAUTION

- *Remove the negative (–) terminal of the battery to avoid the risk of short-circuit and damage to the unit.*
- *Secure the wiring with cable clamps or adhesive tape. To protect the wiring, wrap adhesive tape around them where they lie against metal parts.*
- *If you drill a hole in the engine compartment to directly connect the special red battery lead to the car battery, plug the hole with a rubber bushing to protect the wire. If a rubber bushing is not used, the insulation may be damaged and a short circuit may result due to the vibrations of the car.*
- *Do not route wires where they will get hot, for example where the heater will blow over them. If the insulation heats up, it may become damaged, resulting in a short-circuit through the vehicle body.*
- *Make sure that wires will not interfere with moving parts of the vehicle, such as the gearshift, handbrake or seat sliding mechanism.*
- *Do not shorten any leads. Otherwise the protection circuit may fail to work when it should.*
- *Never feed power to other equipment by cutting the insulation of the power supply wire to tap from the wire. The current capacity of the wire will be exceeded, causing overheating.*
- *Be sure to use the special red battery wire supplied with the amplifier and connect unswitched source greater than 15 A. Use the supplied black ground wire and connect to the vehicle body. (The supplied special red battery and ground wires are designed so that the amplifier can be connected safely.)*

⊘ To prevent damage

- *Do not ground the speaker wire directly or connect a negative (–) wire for several speakers.*
- *Speakers to be connected to the amplifier should conform with the standards listed below. Otherwise damage will be caused to the speaker. The speaker impedance must be 2 to 8 ohms.*

Speaker		Power
Channel	Type	
Two-channel	Sub-woofer	Nominal input: Min. 35 W
	Other than sub-woofer	Max. input: Min. 70 W
One-channel	Sub-woofer	Nominal input: Min. 80 W
	Other than sub-woofer	Max. input: Min. 160 W

- This unit is for vehicles with a 12-volt battery and negative grounding. Before installing it in a recreational vehicle, truck, or bus, check the battery voltage.
- Install and route the special red battery wire supplied with the amplifier as faraway as possible from the speaker wires. Install and route the battery wire, ground wire, speaker wires, and the amplifier as faraway as possible from the antenna, antenna cable and tuner.

(Fig. 22)
[6] Special red battery wire
Connect to unswitched source greater than 15 A.
[7] Ground wire (black)
Connect to metal body or chassis.
[8] Fuse (15 A)
[9] Car stereo with RCA output pin jacks
[10] External output
[11] White
[12] Red
[13] Connecting wires with RCA pin plugs. (sold separately)
[14] RCA input pin jack
[15] Blue
Connect the male terminal of this wire to the blue wire of the car stereo (system control terminal). The female terminal can be connected to the auto-antenna relay control terminal.
If the car stereo does not have a system remote control terminal, connect the male terminal to the power terminal through the ignition switch.
[16] Speaker output terminal
See the "Connecting the Speakers" section for speaker connection instructions.

Connecting the Power Terminal

- *Be sure to use the special red battery wire supplied with the amplifier and connect unswitched source greater than 15 A. Use the supplied black ground wire and connect to the vehicle body. (The supplied special red battery and ground wires are designed so that the amplifier can be connected safely.)*

Connect the special red battery wire to the POWER terminal (+), and the black ground wire to the GND terminal (–).

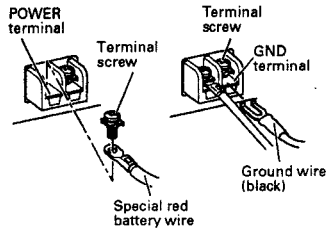


Fig. 24 Fig. 25

- Securely fasten the special red battery wire and the ground wires with terminal screws.

Connecting the Speakers

The speaker output mode can be two-channel (stereo), one-channel (mono), or three-channel (stereo + mono). To connect the speaker wires to suit the mode. Connect the speakers according to the figure below.

Two-channel mode (stereo)

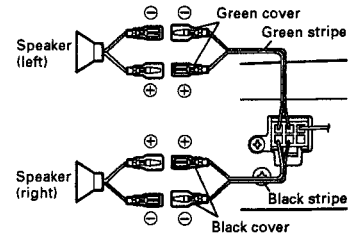


Fig. 26

One-channel mode (mono)

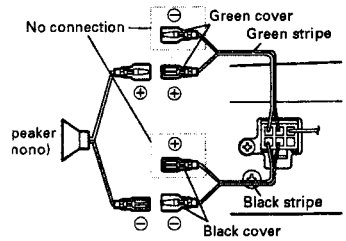


Fig. 27

Three-channel mode (stereo + mono)

The power amplifier is basically a two-channel/one-channel bridgeable amplifier, but three channels can be achieved by combining the stereo and mono modes using inductors and capacitors. See Figs. 28 and 29 for details of wiring.

- *The following Figs. 28 and 29 require advanced understanding of electronics. If you do not understand the diagram, please have the work done by your nearest authorized Pioneer installation specialist.*

Three-channel mode, two-way system

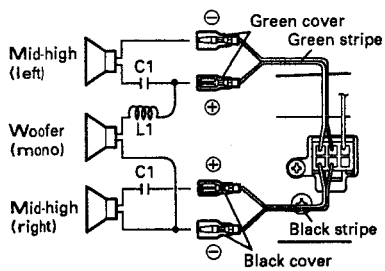


Fig. 28

Three-channel mode, three-way system

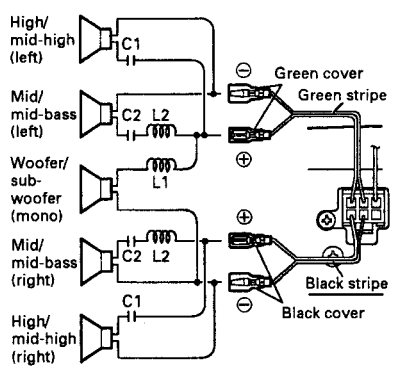


Fig. 29

- The inductor (L1 or L2 in the diagram) acts as a low-pass filter. The capacitor (C1 or C2 in the diagram) acts as a high-pass filter. The inductor (L) shall be used on the woofer/sub-woofer, and capacitor (C) shall be used on the high/mid-high.
- *Remember when bridging an amplifier it will see only half of the original speaker impedance. Therefore, you must use speakers that have ratings of 4 ohms or higher. If you use speakers that have lower impedance ratings it may cause damage to the amplifier.*
- *When the inductors and capacitors are connected to the speaker wires, secure or solder them so they cannot be pulled loose. Tape or use heat shrink on the joints to prevent short circuits.*

Setting the Filter Constant

Low-pass filter (for sub-woofer/ woofer): 6 dB/octave (Fig. 30)

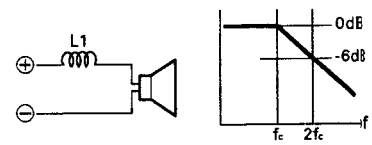


Fig. 30

High-pass filter (for mid/mid-high): 6 dB/octave (Fig. 31)

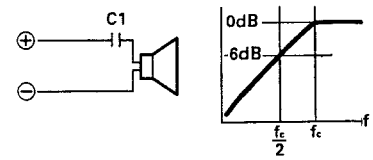


Fig. 31

Band-pass filter (combination of low-pass filter and high-pass filter for mid-bass/mid): 6 dB/octave (Fig. 32)

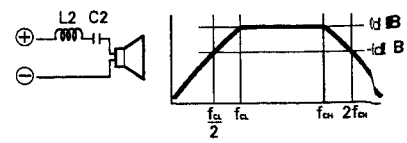


Fig. 32